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WARTIME FEED MIXTURES FOR TURKEYS

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Turkey producers are faced with many feeding problems as a result of war-time conditions. Many feedstuffs normally used are now very costly to use, difficult to obtain, or even unavailable. The tremendous wartime increases in numbers of livestock of all kinds has created a very heavy demand for all feeds. However, some feedstuffs are available in comparatively larger quantities than others, therefore new feed formulas are needed to make the best use of the feeds that are available.

Efficient Use and Conservation of Feeds

The comparatively short supplies of protein supplements, of phosphorous supplements, and of vitamin A and riboflavin concentrates makes it essential that these feedstuffs be used in the quantity and in the combinations in which they are most effective. A voluntary program for the conservation of the especially limited supplies of feedstuffs of animal origin has been developed by the Feed Industry Council and the Department of Agriculture.

The program limits the quantities of such animal protein supplements as meat scrap, fish meal, tankage, liver meal and dried milk by-products that may be used in different kinds of mixed feeds. The limitations are upon the quantity of protein per 100 pounds of mixed feed that may be from one or a combination of several of the animal protein supplements. Turkey feeds are affected as indicated:

Kind of feed	Total pounds of animal protein per 100 pounds of mixed feed
Turkey starting diets	2.50
Turkey growing mash to be fed with grain	2.25
All mash turkey breeding diets	2.25
Turkey breeding mashes to be fed with grain	4.50

The use of fish meal is limited to starter and breeder mashes except in emergency cases, and in areas where other animal protein feedstuffs are not available.

The vitamin A requirements for human and animal foods had necessitated War Production Board Limitation Order L-40, limiting the vitamin A derived from fish oils to 3000 U.S.P. units per pound of total feed for turkeys. The use of other feedstuffs is limited only by cost and availability.

Changing Feed Formulas

Profits on turkey production operations depend to a large measure on the cost of feed and on the efficiency of growth and production obtained.

Under present conditions it is impossible to provide feed formulas that will be satisfactory under all local and emergency situations that may arise. The feed mixtures suggested in this publication do not have as great a margin of safety on some of the essential nutrients as that provided under normal conditions. However, mixtures of the type suggested have given satisfactory results. They are comparatively cheap, and make use of the available feedstuffs.

Substitutions for Ingredients

Some substitutions that may be made in these feed mixtures are suggested in order to assist in the adaption of these mixtures to local feed situations and emergency conditions without materially altering the feeding value of the mixed feed.

Grain and Grain Byproducts:

The grain and grain byproducts part of any of these diets may be made up of many different combinations which will be equally satisfactory. The grains and grain byproducts used should depend principally upon the availability and cost, and upon the fiber, protein, mineral, and digestible nutrients content.

The proximate composition of these materials is as follows:

Ingredient	Protein	Fiber	Calcium	Phosphorus	Digestible nutrients
	Percent	Percent	Percent	Percent	Percent
Barley	11.8	5.9	.05	.36	68
Corn	9.3	2.1	.01	.29	80
Milo	11.0	2.2	.04	.32	80
Oats	11.2	11.3	.10	.36	62
Wheat	12.4	2.4	.04	.39	73
Wheat bran	15.6	9.0	.11	1.21	41
Wheat middlings	16.9	6.6	.07	.69	48

The quantity of oats, wheat bran, wheat middlings, and barley that may be utilized in starting diets is limited by the fiber content of these feeds. Poults starting diets should not contain more than 5 or at the most 6 percent of fiber. However, growing and breeding diets containing as much as 10 percent of fiber are satisfactory. If it is necessary to use large amounts of oats, barley, or other high-fiber materials fine grinding for the first two weeks will make it possible for poults to thrive at the higher levels. The grain part of these diets should be made up of two or preferably more grains, or their byproducts. Feeds that contain large quantities of the grains or byproducts that are low in digestible nutrients may be expected to require somewhat more feed per pound of gain or more feed per bird per day.

Alfalfa Leaf Meal:

In the starting and breeding diets alfalfa leaf meal containing 20 percent protein and not less than 90,000 International Units of vitamin A activity per pound is preferred. Bright green leafy alfalfa or other bright green leafy legume

hay that has been ground through a hammer mill with 3/16 inch screen may be satisfactorily used in the growing diets containing 10 percent alfalfa meal.

Protein Supplements:

In these suggested feed mixtures, that contain large quantities of soybean meal, only properly heat-treated soybean meal should be used. Ground raw soybeans cannot be satisfactorily substituted for soybean meal and is not recommended except in extreme emergencies. When peanut meal, cottonseed meal, or corn gluten meal are more readily available than soybean meal, they may replace 40 or 50 percent of the soybean meal. Linseed meal is not a suitable protein feed for turkeys.

Minor substitutions are suggested for the limited quantities of animal proteins present. Meat and bone scrap may be used in these mixtures instead of meat scrap. Dried whey may be replaced by other riboflavin concentrates that will supply 27.5 micrograms of riboflavin per gram. No other replacements are suggested except that in emergencies the following combinations may be used as substitutes for fish meal, meat scrap, or dried skim milk on the basis shown.

Ingredient	Substitutes for		
	Fish meal	Meat Scrap	Dried skim milk
	Percent	Percent	Percent
Soybean meal	87	75	50
Steamed bonemeal or equivalent	5	13	--
Salt	2	2	--
Dried distillers' solubles or other supplements containing 20 micrograms of riboflavin per gram	6	10	50
	100	100	100
	<u>Pounds</u>	<u>Pounds</u>	<u>Pounds</u>
Quantity of substitute required to replace 1 pound of fish meal, meat scrap or dried skim milk	2.5	2.0	2.0

Riboflavin Supplement:

The dried distillers' solubles that contains 20 micrograms of riboflavin per gram may be replaced by an equal quantity of riboflavin from other riboflavin concentrates. That is, 6 percent of dried distillers' solubles may be replaced by 4 percent of a riboflavin concentrate that contains 30 micrograms per gram or by 8 percent of a concentrate that contains 15 micrograms per gram. If a commercial proprietary vitamin and trace mineral supplement is used as a source of riboflavin the quantity used should be based on its riboflavin content and the necessary adjustments made in other ingredients of the diet to compensate for the other vitamins, protein, and minerals contained in the product.

Minerals:

Ground limestone and ground oystershells may be used interchangeably. Steamed bonemeal may be replaced by defluorinated superphosphate or other phosphorus supplements that contain .1 percent or less of fluorine. Such substitutions should be made on the basis of phosphorus content with an adjustment of the calcium

in the diet when necessary. For emergency use only, rock phosphates containing as little as possible of fluorine may be utilized but should not be used in quantities that will add more than .035 percent of fluorine to the diet.

The manganized salt in these feed mixtures is made by pre-mixing feeding-grade manganese sulphate in the salt so as to provide .4 ounce per 100 pounds or 1/2 pound manganese sulphate per ton of starting, growing, and all-mash breeding diets, and double that amount or 1 pound per ton in the breeder mash to be fed with grain.

Vitamin D Supplement

The vitamin D powder should contain 2000 A.O.A.C. chick units of vitamin D per gram. The vitamin A and D oil should contain 400 units of vitamin D and 1000 U.S.P. units of vitamin A per gram. In the breeding diets, feeding oil containing 2000 units of vitamin A may be used without exceeding the limitations on vitamin A. If vitamin A and D oils are not available a quantity of D-activated animal sterol that supplies the same quantity of vitamin D may be used, provided the other ingredients are known to supply ample vitamin A. Sunshine is the cheapest source of vitamin D and when the birds receive direct sunshine daily, vitamin D in the feed is not necessary.

Grit

It is worth while to provide a little hard, insoluble grit once or twice a week to all turkeys that are confined or do not have access to small stones or pebbles. River gravel, granite, quartz or similar insoluble rock material of a suitable size is recommended.

Range

The maximum possible use should be made of good ranges. Fresh green feed, especially the young growing portion, is an excellent source of all known vitamins, except vitamin D and is also a source of some protein of high quality.

Feeding Instructions

Poults should be given feed and water as soon as possible after they are removed from the incubator because experience has shown that the earlier feed and water are available the less difficulty there will be encountered in teaching the poults to eat. Poult delivery schedules should be planned so that the poults receive feed and water within 24 hours, preferably not more than 36 hours, after hatching. If because of shipping delays or other reasons, poults do not receive feed and water within 36 hours after hatching it is a good practice to dip the beak of each poult into the water and the feed at the time they are placed in the brooder. The placing of some contrasting feedstuff, such as rolled oats, or bright shiny objects, such as marbles, on top of the starting diet in the feeders, and placing some feed on paper or boards under the brooder have been found to be helpful in getting poults to start eating. The failure of poults to learn to drink, or to eat and drink, is the cause of the loose, slimy gizzard linings found in poults that die in the first week. First-week mortality may be reduced by giving backward poults individual lessons on eating and drinking.

Grain should be available to the poult in separate hoppers after they are 6 or 8 weeks old. Sprinkling a little grain in the mash hopper will encourage grain consumption. Somewhat more grain will be consumed if the individual grains are fed separately rather than mixed together.

The growing diets suggested in this publication are to be fed after the poult is 8 weeks old. If the poult is not exposed to direct sunshine 0.1 percent of vitamin D powder should be added. Growing diet No. 7W is suitable for use only with range of fair quality and diet No. 8W is suitable for use only with good range.

All-mash breeder diets generally give slightly more uniform results than grain and mash diets. Breeder diets No. 9W and 10W are to be fed as all-mash diets. Breeder diets No. 11W and 12W are to be fed with an equal quantity of grain. All diets in this publication contain adequate calcium and the feeding of additional limestone grit or oystershell is not recommended.

On the other hand, if the practice of allowing breeding stock access to limestone grit or oystershell is preferred by the feeder 2.5 percent of the limestone in diets No. 9W and 10W, and 5 percent of the limestone in diets No. 11W and 12W should be replaced by grain. The limestone grit consumption should then be limited in such a way that it is not less than 2 or more than 3 percent of the all-mash diet, or not less than 4 or more than 6 percent of the mash to be fed with grain.

Table 1.-Suggested Starting Diets for Turkeys.

Ingredient	Diet 1W	Diet 2W	Diet 3W	Diet 4W
	Percent	Percent	Percent	Percent
Yellow corn, freshly ground	25.0	----	20.0	25.0
Wheat, freshly ground	20.0	30.0	----	----
Oats, finely pulverized	----	15.0	10.0	10.0
Wheat middlings	----	----	15.0	10.0
Wheat bran	----	----	5.0	5.0
Alfalfa meal	8.0	7.5	5.0	2.0
Soybean meal	35.0	37.5	32.0	32.0
Fish meal	3.0	3.0	----	2.5
Meat scrap	1.0	----	2.0	----
Dried skim milk	----	----	4.0	3.0
Dried whey (27.5 micrograms riboflavin per gram)	----	4.5	----	----
Dried distillers' solubles (20 micrograms riboflavin per gram)	6.0	----	4.5	7.0
Ground limestone	1.25	1.0	1.5	2.0
Steamed bonemeal	----	.5	----	----
Manganized salt	.65	.9	.9	1.0
Vitamin D powder (2000 D)	.1	.1	.1	----
Vitamin A & D oil (1000 A-4000)	----	----	----	.5

Table 2.-Suggested Growing Diets for Turkeys.

Ingredient	Diet 57	Diet 67	Diet 77 ^{1/}	Diet 87 ^{2/}
	Percent	Percent	Percent	Percent
Yellow corn, coarsely ground	25.0	-----	20.0	30.0
Wheat, coarsely ground	-----	10.0	20.0	-----
Oats, ground	10.0	20.0	-----	20.0
Wheat middlings	10.0	20.0	10.0	20.0
Wheat bran	10.0	-----	10.0	-----
Alfalfa meal	10.0	10.0	3.0	-----
Soybean meal	25.0	23.0	25.0	25.0
Meat scrap	2.5	2.5	2.5	-----
Dried distillers' solubles (20 micrograms riboflavin per gram)	3.0	-----	-----	-----
Dried distillers' grains with solubles (13 micrograms riboflavin per gram)	-----	10.0	5.0	-----
Ground limestone	2.5	2.5	2.5	2.5
Steamed bonemeal or equivalent	1.0	1.0	1.0	1.5
Manganized salt	1.0	1.0	1.0	1.0

1/ to be used only when fair or good range are used.

2/ to be used only when good range is used.

Table 3.-Suggested Breeding Diets for Turkeys.

Ingredients	All-mash diets		Mash to be fed with grain	
	97	107	117	127
	Percent	Percent	Percent	Percent
Yellow corn, coarsely ground	40.0	-----	25.0	-----
Wheat, coarsely ground	-----	47.5	-----	25.0
Oats, ground	10.0	25.0	10.0	15.0
Wheat middlings	15.0	-----	10.0	-----
Wheat bran	10.0	-----	-----	10.0
Alfalfa leaf meal	4.0	6.0	10.0	10.0
Soybean meal	10.0	10.0	20.0	14.0
Fish meal	-----	3.0	-----	7.5
Meat scrap	2.0	-----	4.0	-----
Dried milk	2.5	-----	5.0	-----
Dried whey (27.5 micrograms riboflavin)	1.0	-----	4.5	-----
Dried distillers' solubles (20 micrograms riboflavin)	-----	3.0	-----	7.5
Ground limestone	3.5	3.0	6.5	6.5
Steamed bonemeal or equivalent	1.0	1.5	3.0	2.5
Manganized salt	.7	.7	1.4	1.4
Vitamin A & D oil (2000 A - 400 D)	.3	.3	.6	.6